TEST CASE MINIMIZATION FOR MODEL TRANSFORMATIONS: AMULTI-OBJECTIVE APPROACH

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Abstract - Model transformations play an important role related to the evolution of systems in various fields such as healthcare, automotive and aerospace industry. Thus, it is important to check the correctness of model transformation programs. Several approaches have been proposed to generate test cases for model transformations based on different coverage criteria (e.g., statements, rules, metamodel elements, etc.). However, the execution of a large number of test cases during the evolution of transformation programs is time-consuming and may include a lot of overlap between the test cases. In this paper, we propose a test cases selection approach for model transformations based on multi-objective search. We use the non-dominated sorting genetic algorithm (NSGA-II) to find the best trade-offs between two conflicting objectives: (1) maximize the coverage of rules and (2) minimize the execution time of the selected test cases. We validated our approach on several evolution cases of medium and large ATL programs.

Keywords - Model Driven Engineering, Testing, SBSE, NSGA-II